



MIT International Center for Air Transportation

Before and After the Bubble:

An Analysis of Dynamics of the US Commercial Air Transportation System

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JUP Meeting
April 2003



Massachusetts
Institute of
Technology

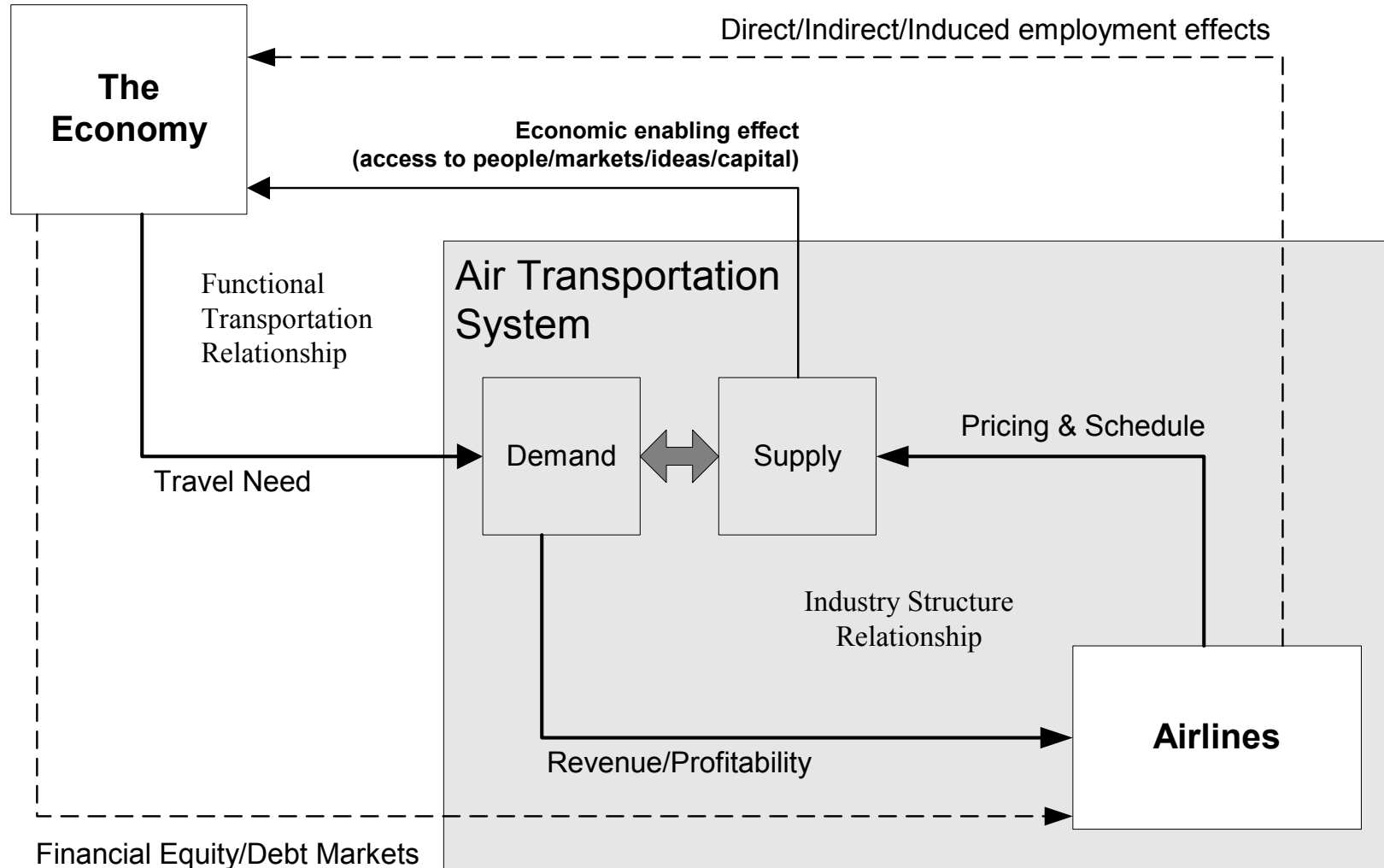


- **System Performance**
- **Operational Changes Since 9/11**
- **Industry Sustainability**
- **Implications**

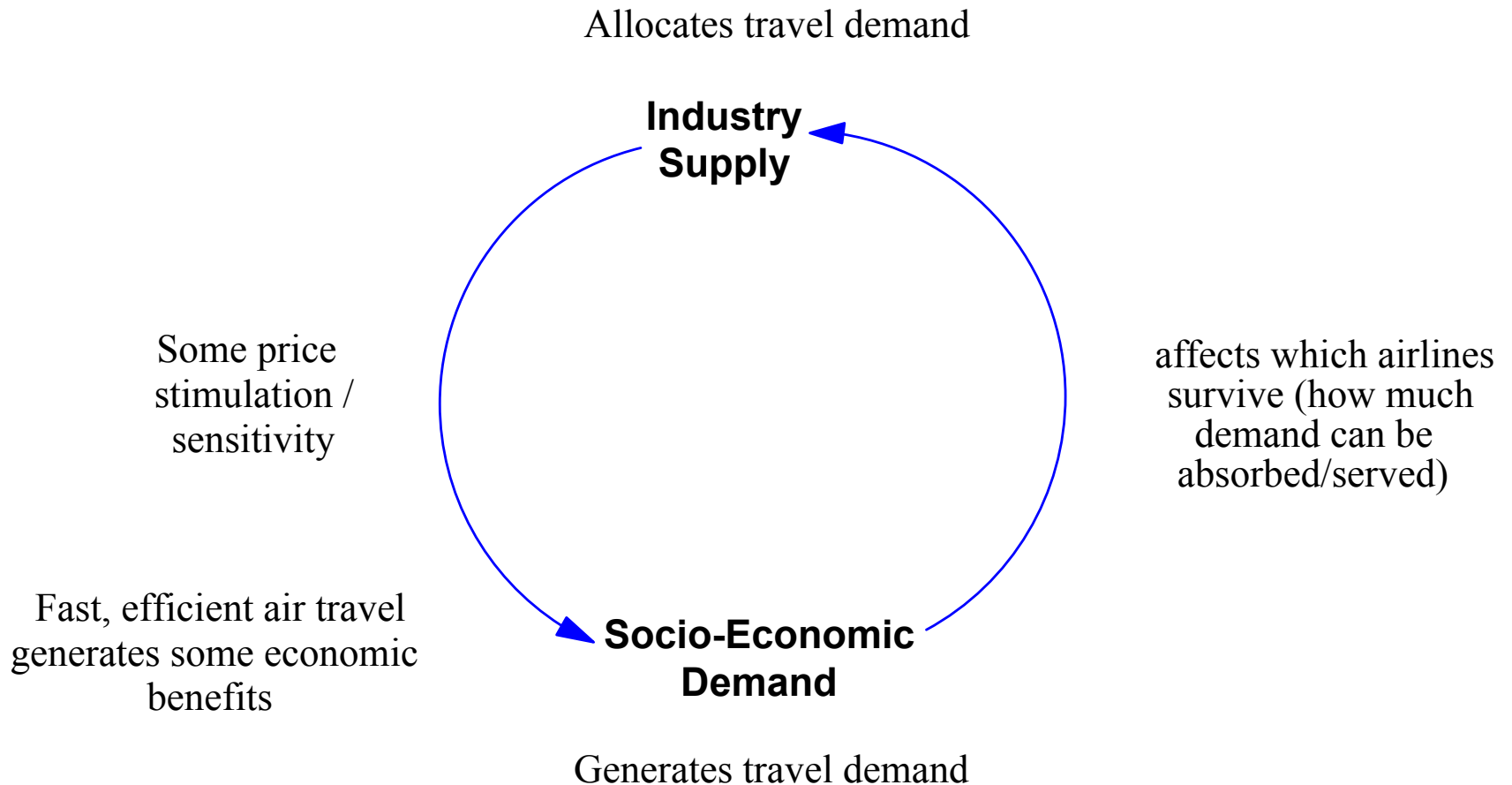


The Air Transportation System in the United States

Conceptual Model



Relationships





Air Transportation System

- **Two primary dynamics**
 - Transportation product
 - Financial environment
- **Traffic and financial indicators**
evaluate the “health” of the system



Forces & Trends before 9/11

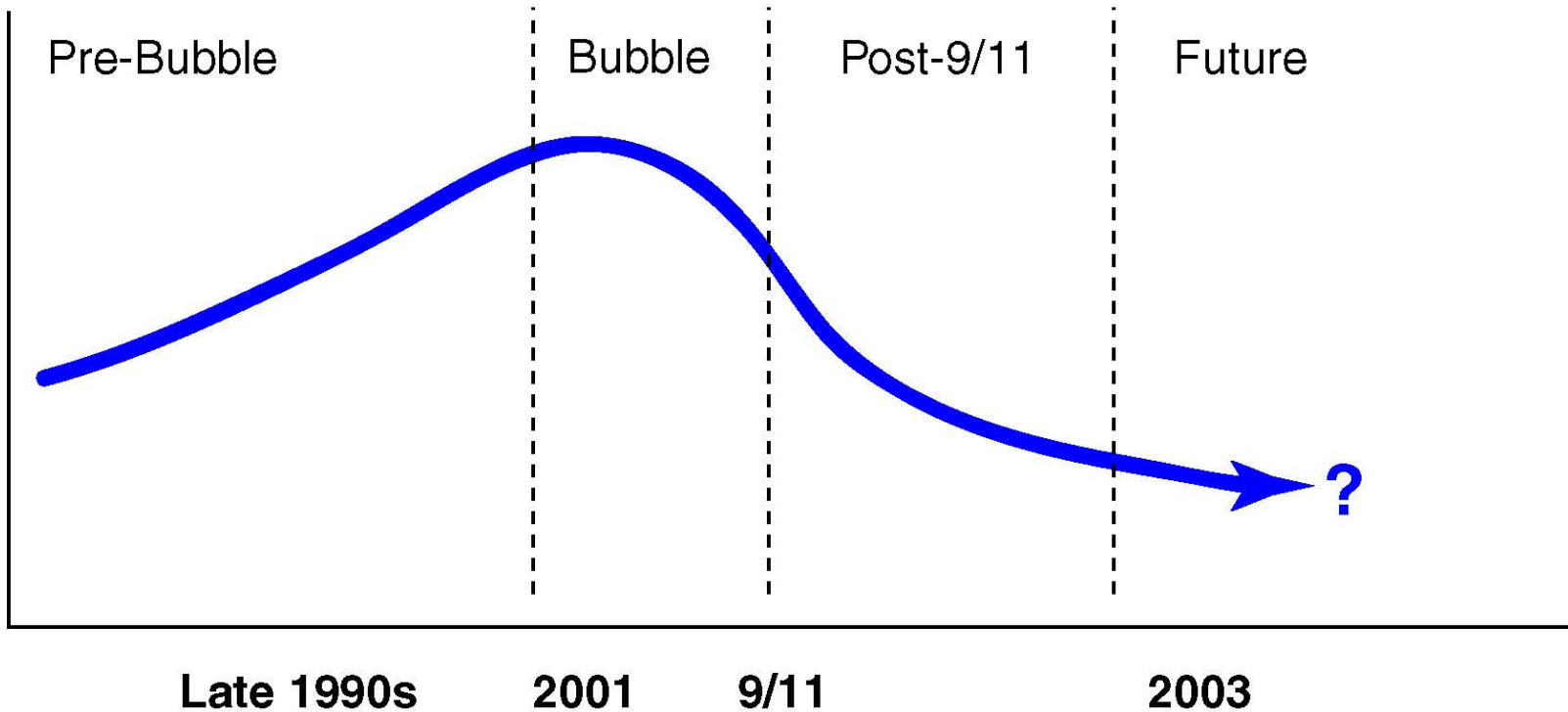
Major Forces

Travel Demand
Market Expectations
Competition
Capacity Limitations
Fuel
Labor
Regulatory
Environmental
Information Technology
Media
Equity Markets

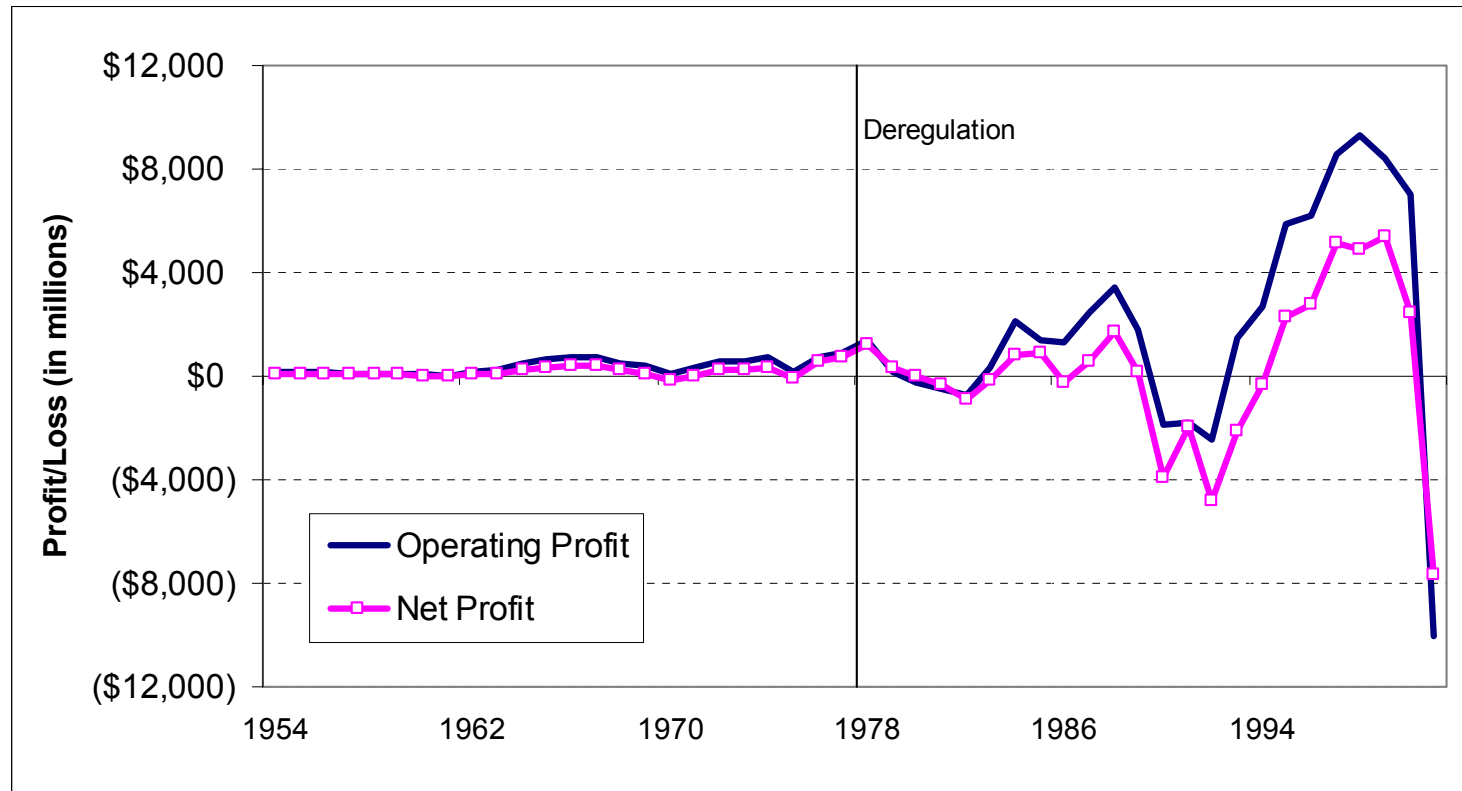
Major Trends

Consolidation (mergers, alliances, codesharing, suppliers)
Alliances
Rising Demand
Fleet Changes
Revenue Management & Increased Load Factors
Decreasing Robustness
Delays
Cancellations
Passenger Frustration

The Bubble



Industry Profitability



Cyclic pattern

Source: ATA data



Performance Since 9/11

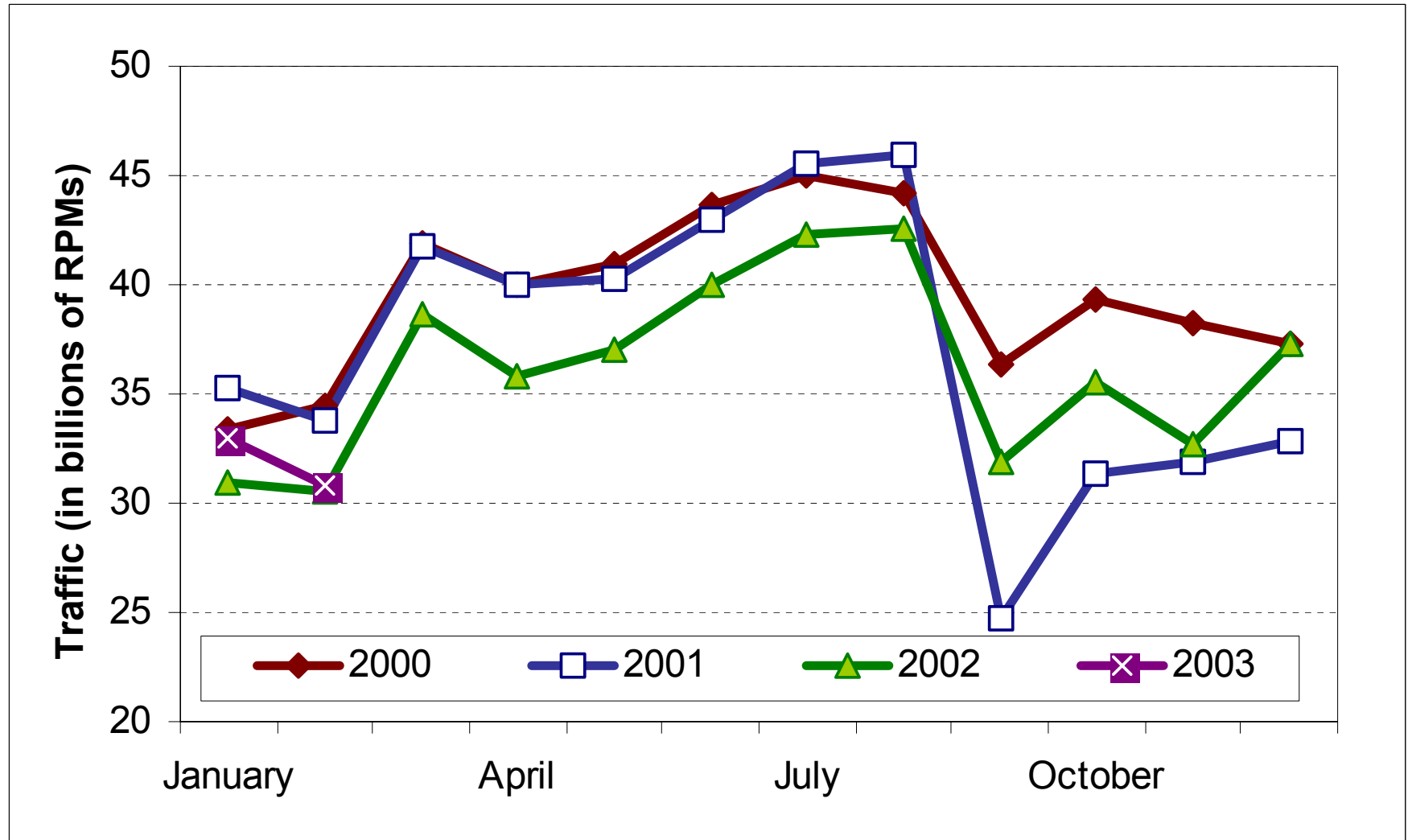




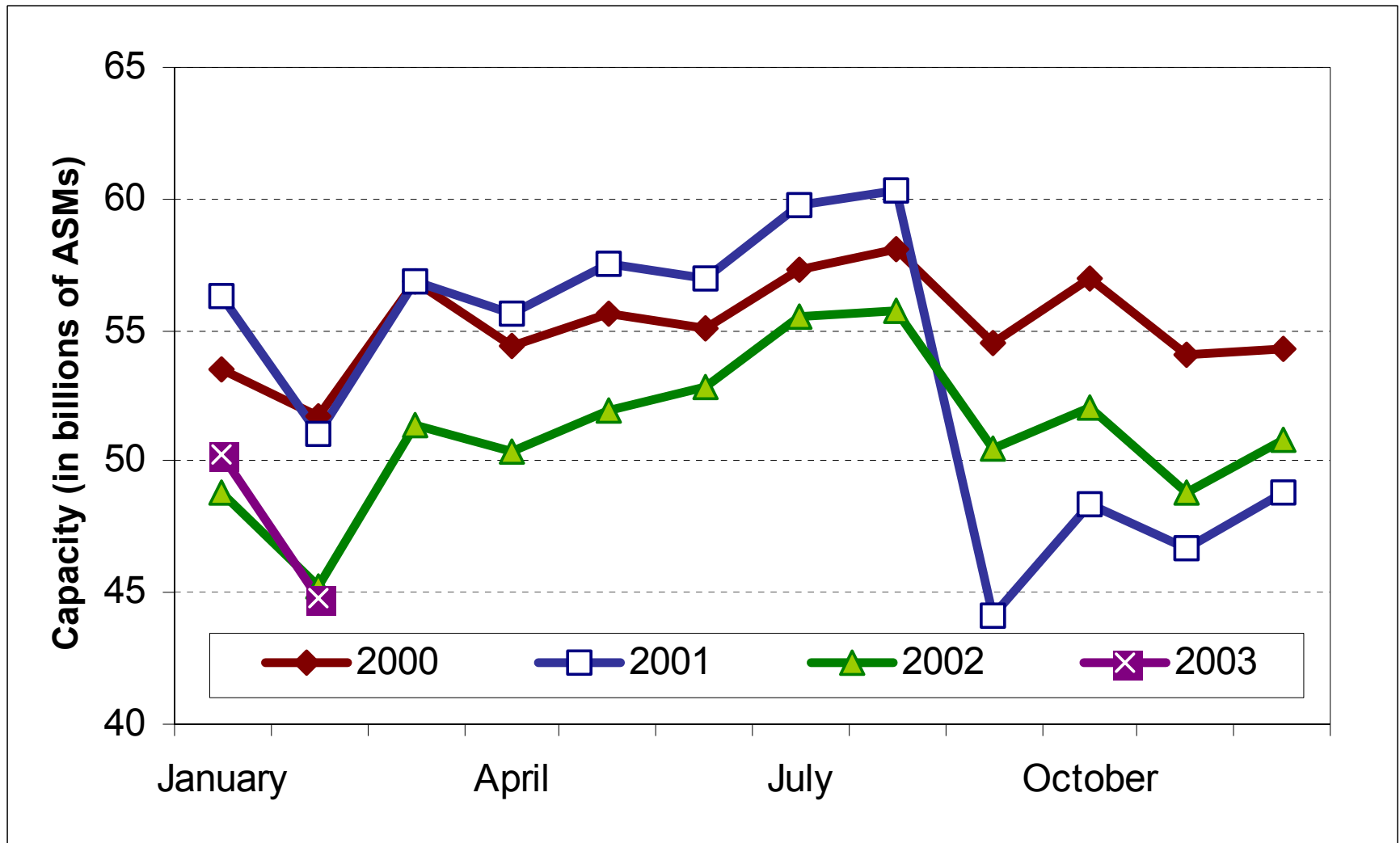
Performance Metrics

Profitability
Traffic and Load Factors

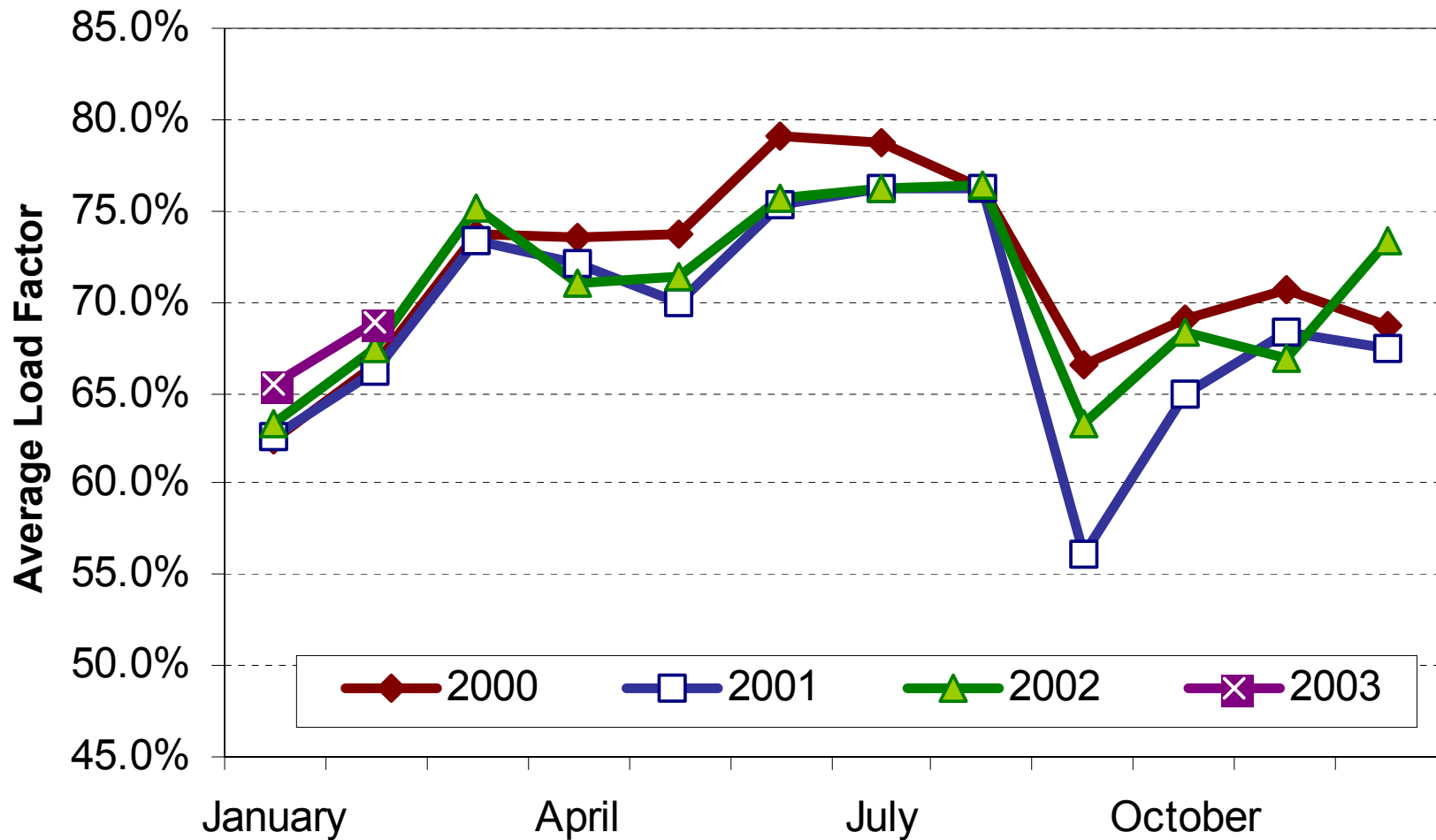
Traffic (RPMs)



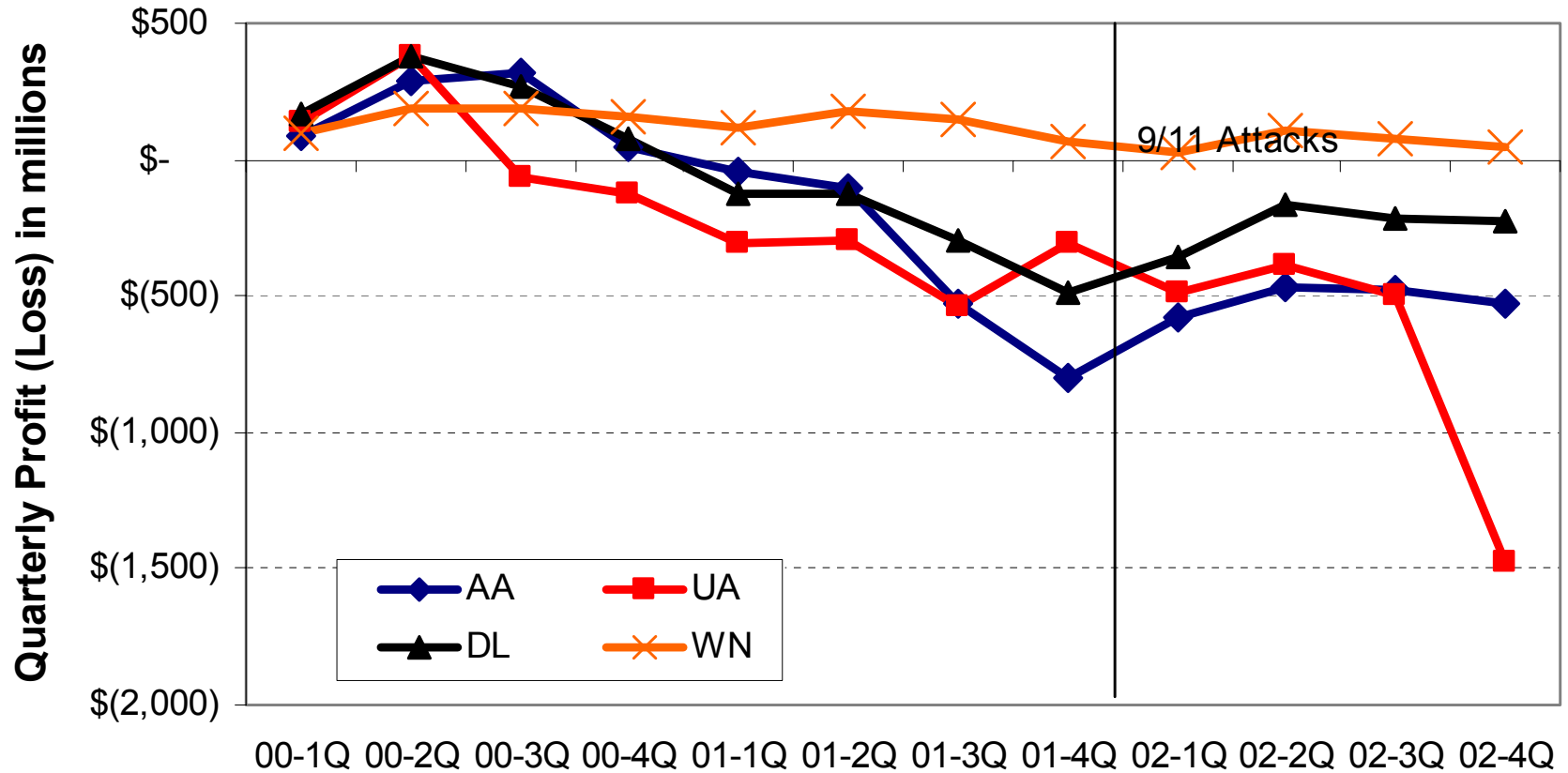
Capacity (ASMs)



Average Load Factor



Airline Profitability

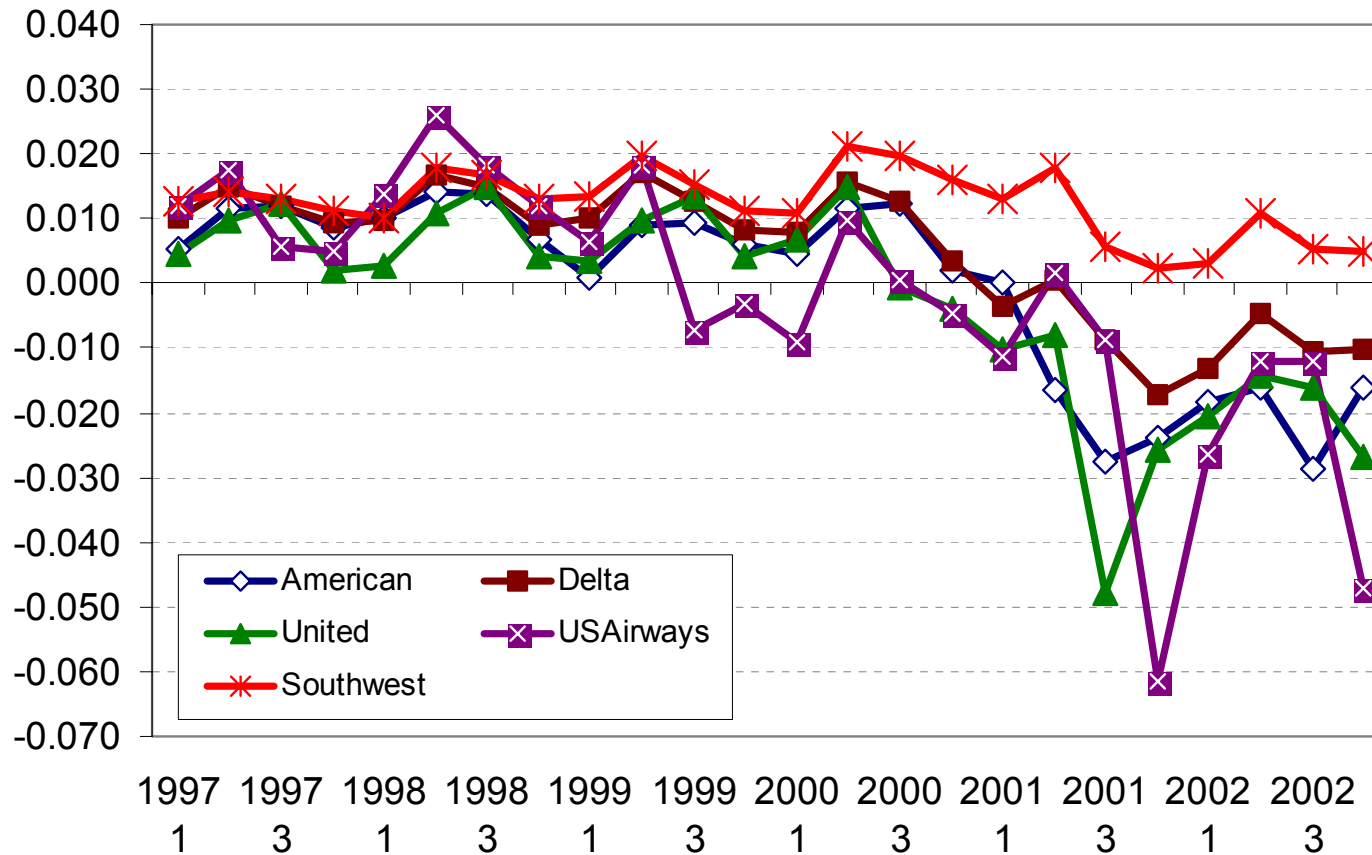


Only Southwest has maintained profitability after 9/11.

Source: Airline financial reports

Revenues vs. Costs

RASM-CASM Gap: 1997-2002



Source: DOT Form 41 Data and airline financial reports



-
- **Traffic has decreased**
 - **Revenues have decreased more**



Operational Changes



Actions

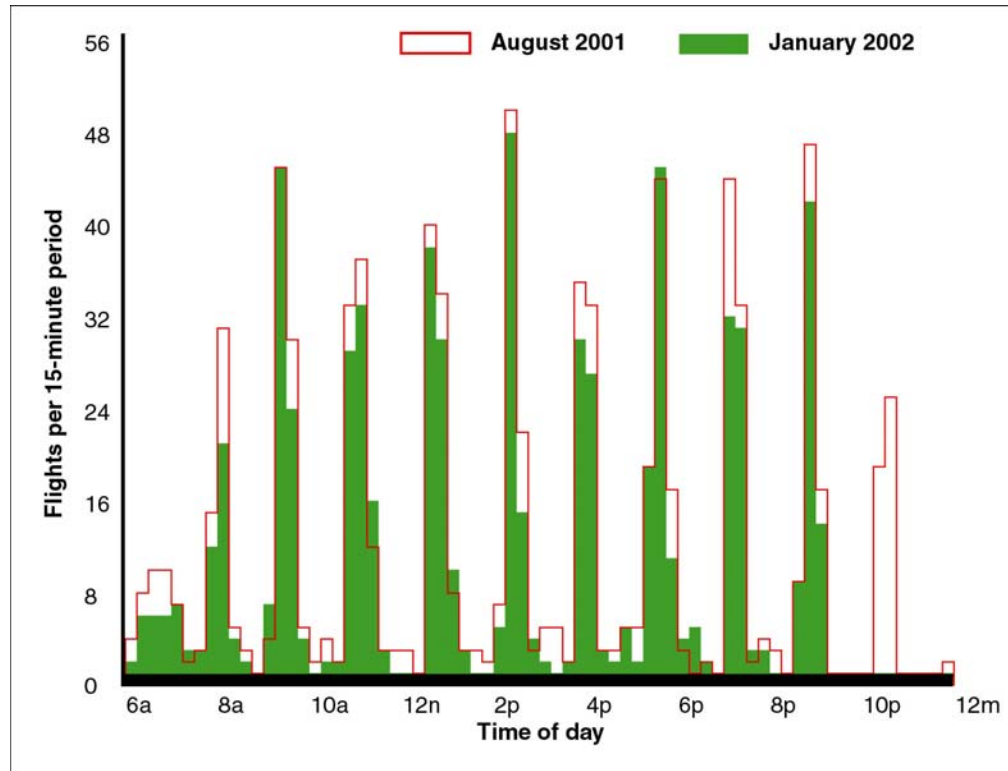
Capacity reductions
Service reductions
Network/fleet changes
Hub restructuring
Labor
Fuel
Taxes

Hub and Spoke Networks



Source: OAG, July 2000

Capacity Reductions



Source:
AA Electronic
Timetables

Capacity decrease at American after 9/11 was achieved by elimination of the last bank; hubs survived.



Service Reductions

Most communities retained service after 9/11 with reduced frequencies or smaller aircraft. Most discontinued cities had alternate service nearby.

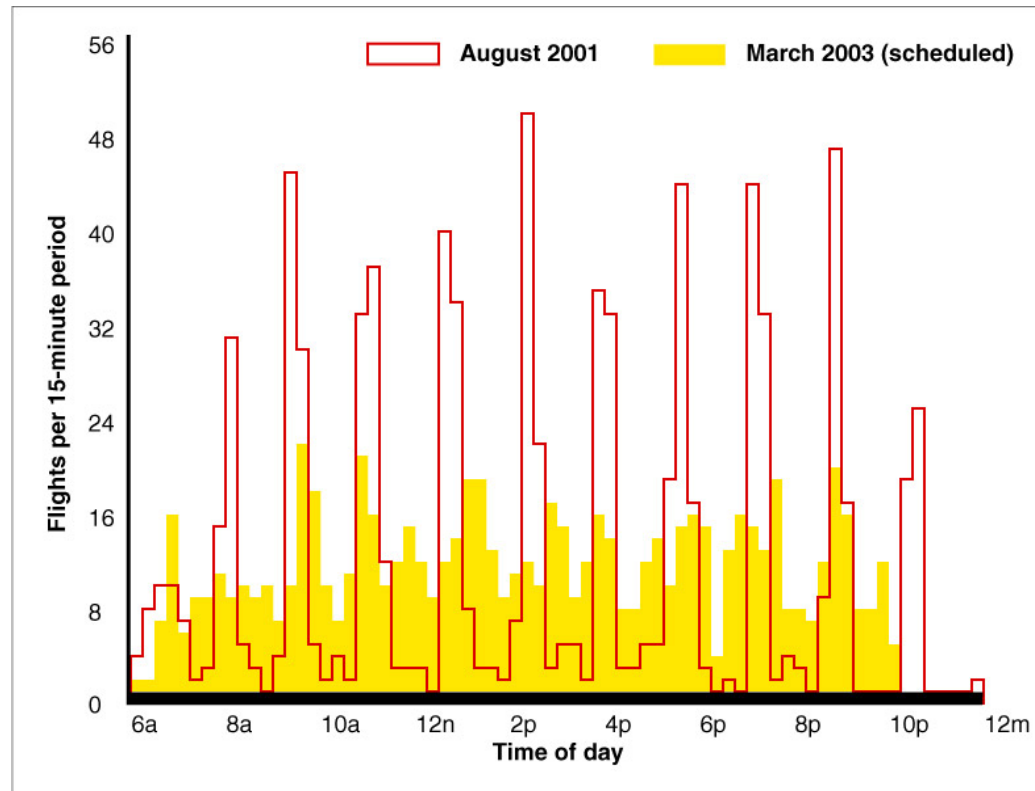
Continental

- Near DFW (<150 miles):
Abilene, Tyler, and Waco
- Near MCO (<50 miles):
Daytona Beach,
Melbourne
- Near PHL: Atlantic City

United

- Bellingham, WA
- Little Rock, AR
- Victoria, BC
- Mobile, AL
- Lynchburg, VA
- Newport News, VA
- Staunton, VA.

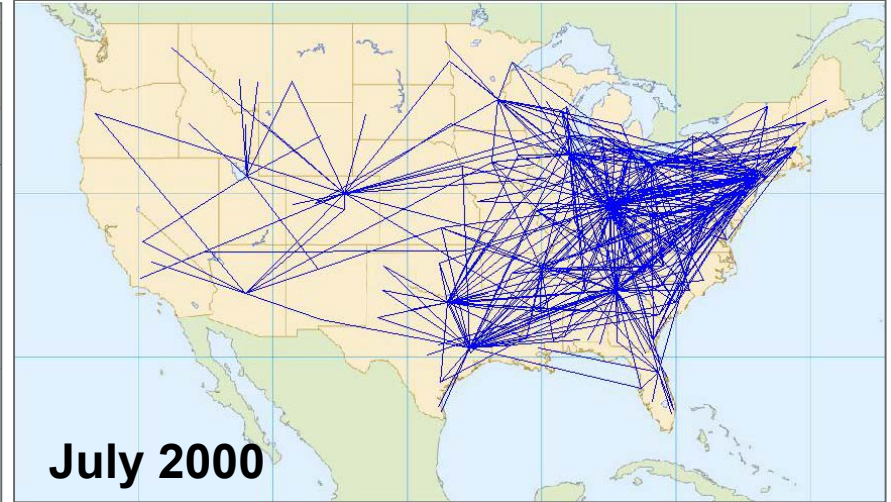
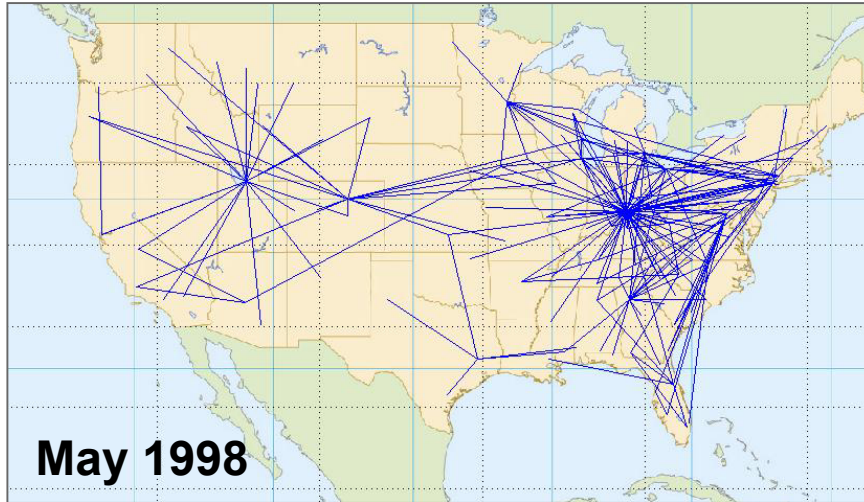
Hub Restructuring



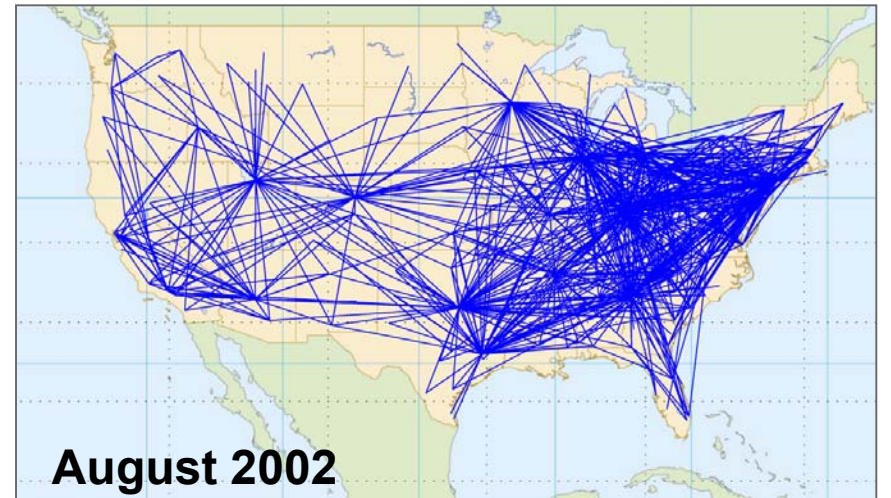
Source:
AA Electronic
Timetables

American is converting to a rolling bank system at DFW; more efficient, but may decrease connectivity.

Fleet Changes

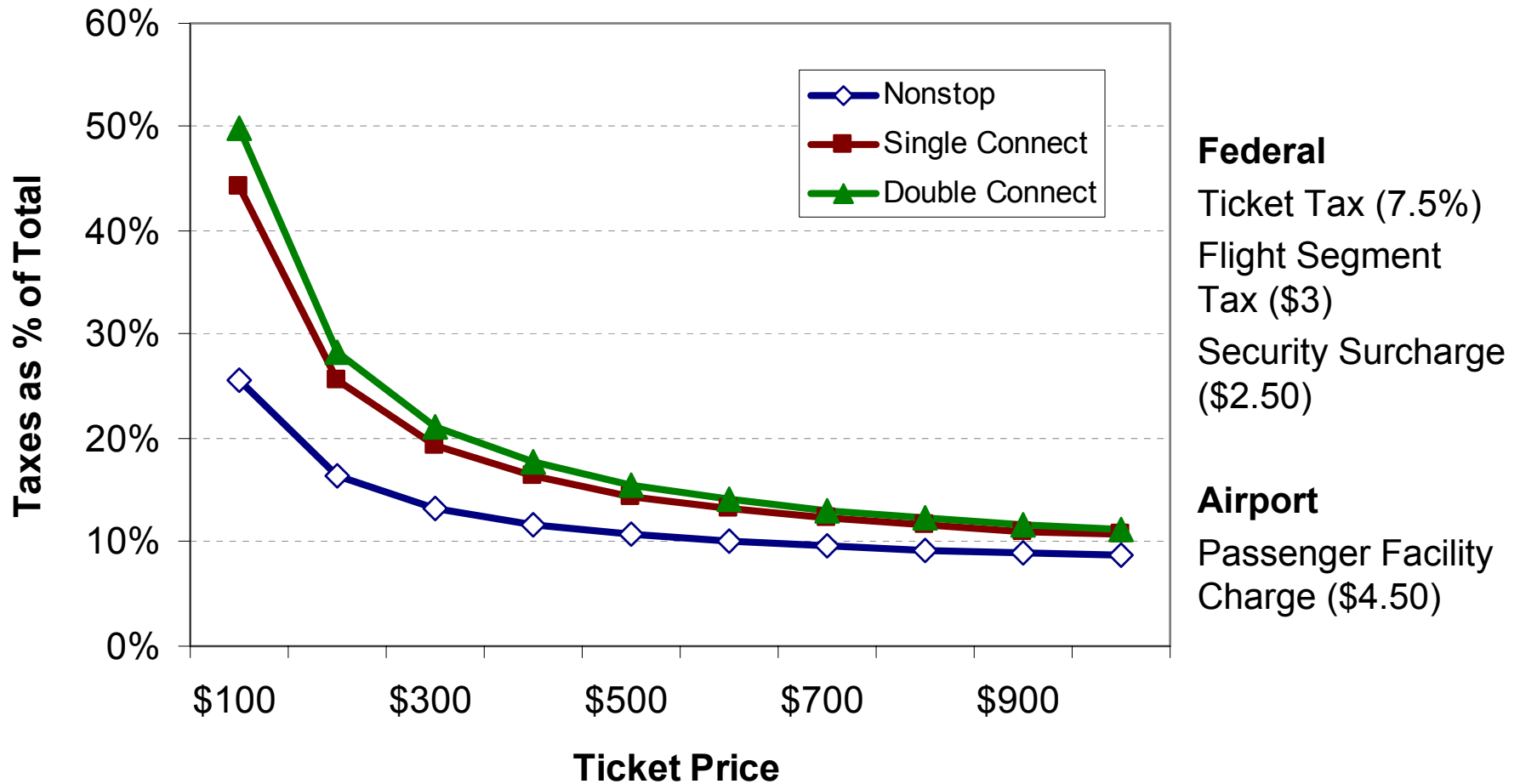


**Regional jets deployed
throughout airline networks**



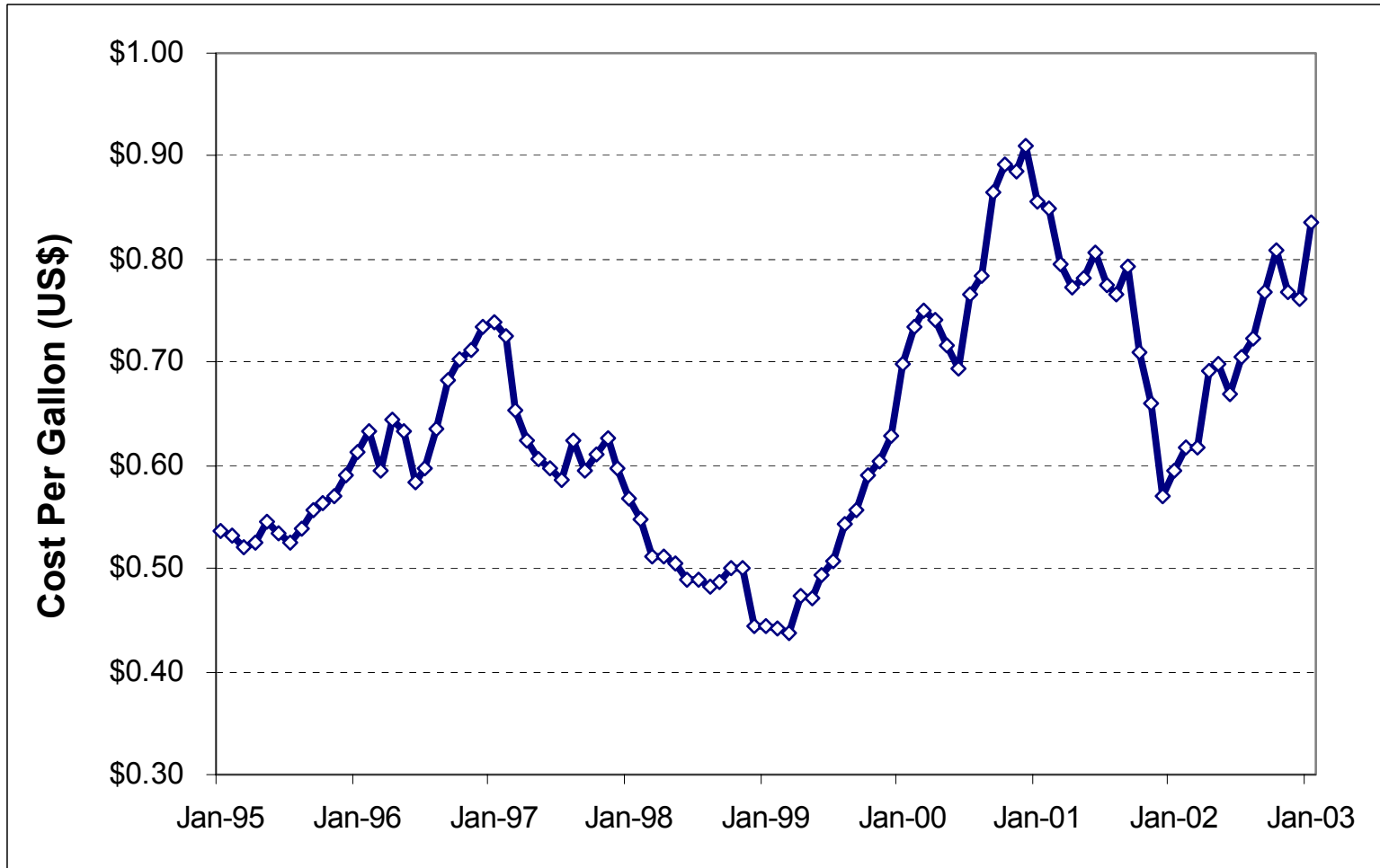
Source: OAG and ETMS data, 1998-2002.

Aviation Taxes & Surcharges



Source: ATA

Domestic Fuel Prices: 1995-2003



Source: ATA data; All US Majors, Nationals, Large Regionals – All Services



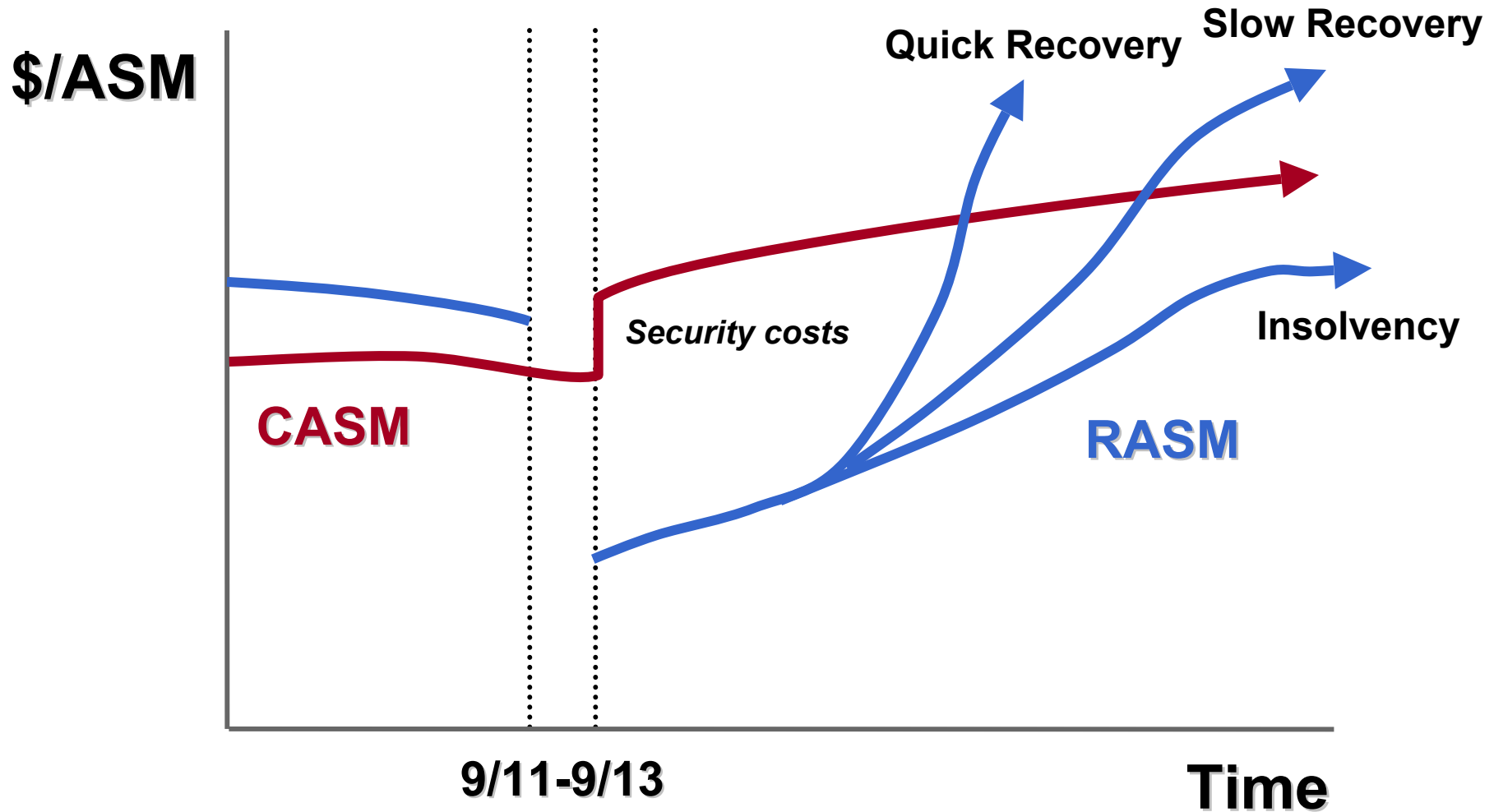
Other Sensitivities

- **Labor Costs**
- **Security Costs**



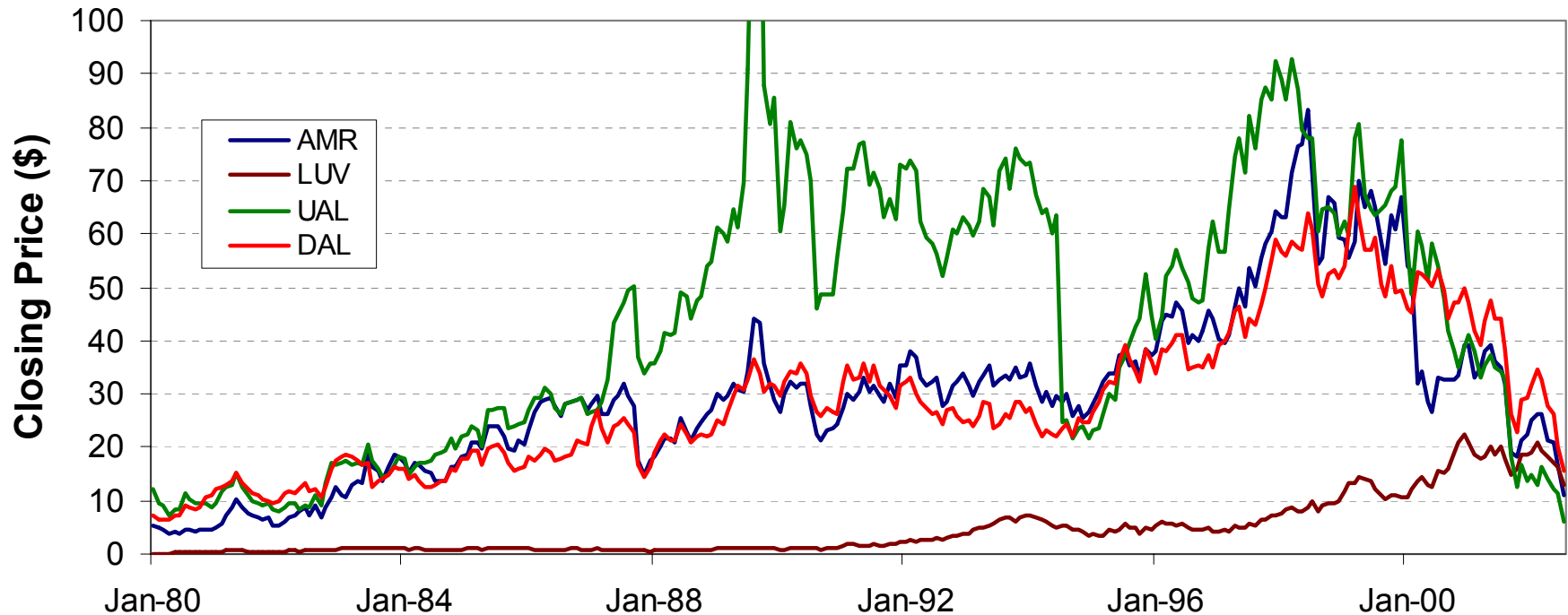
Financial Sustainability

Industry/Airline Recovery

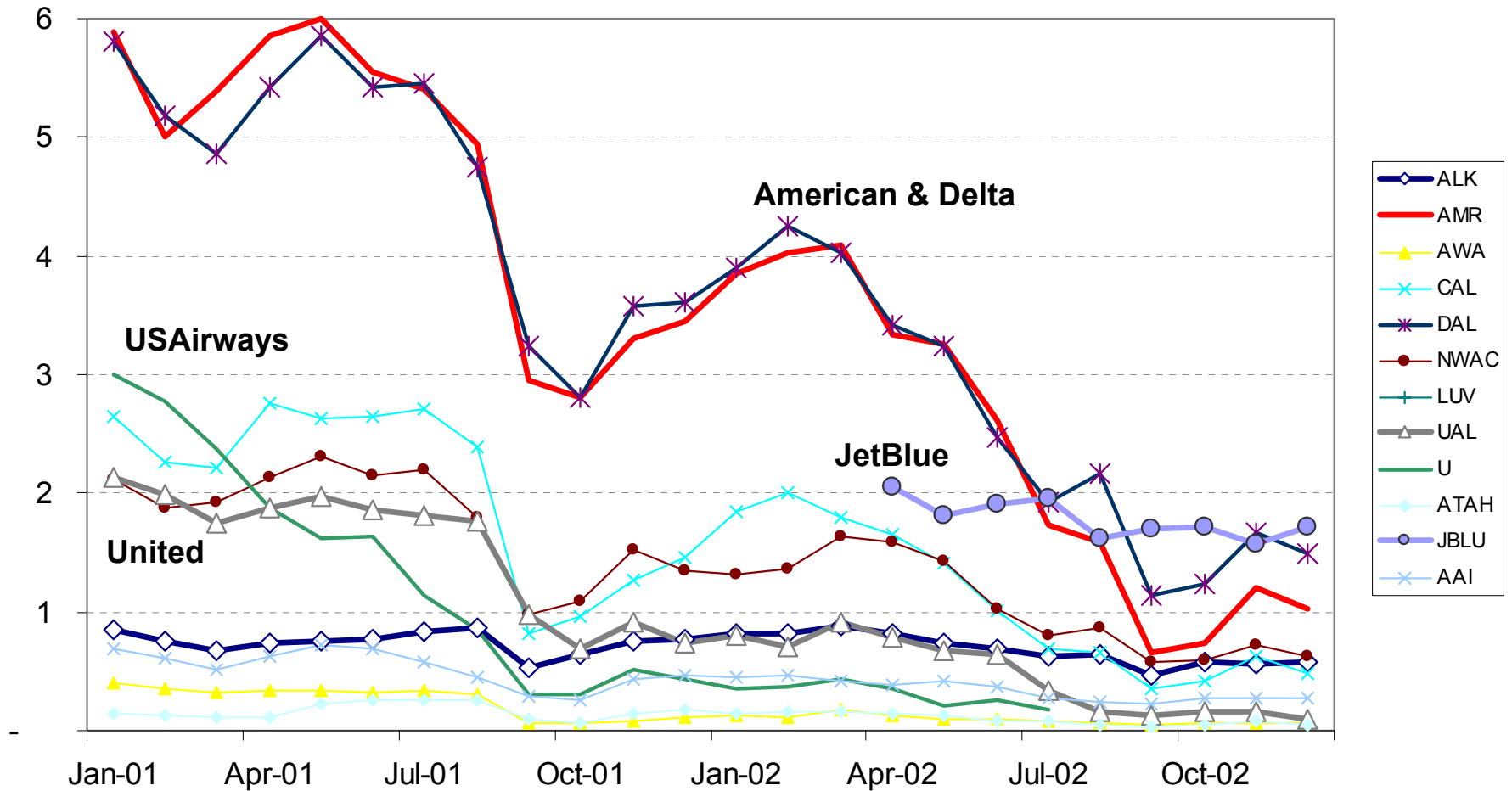


Stock Prices

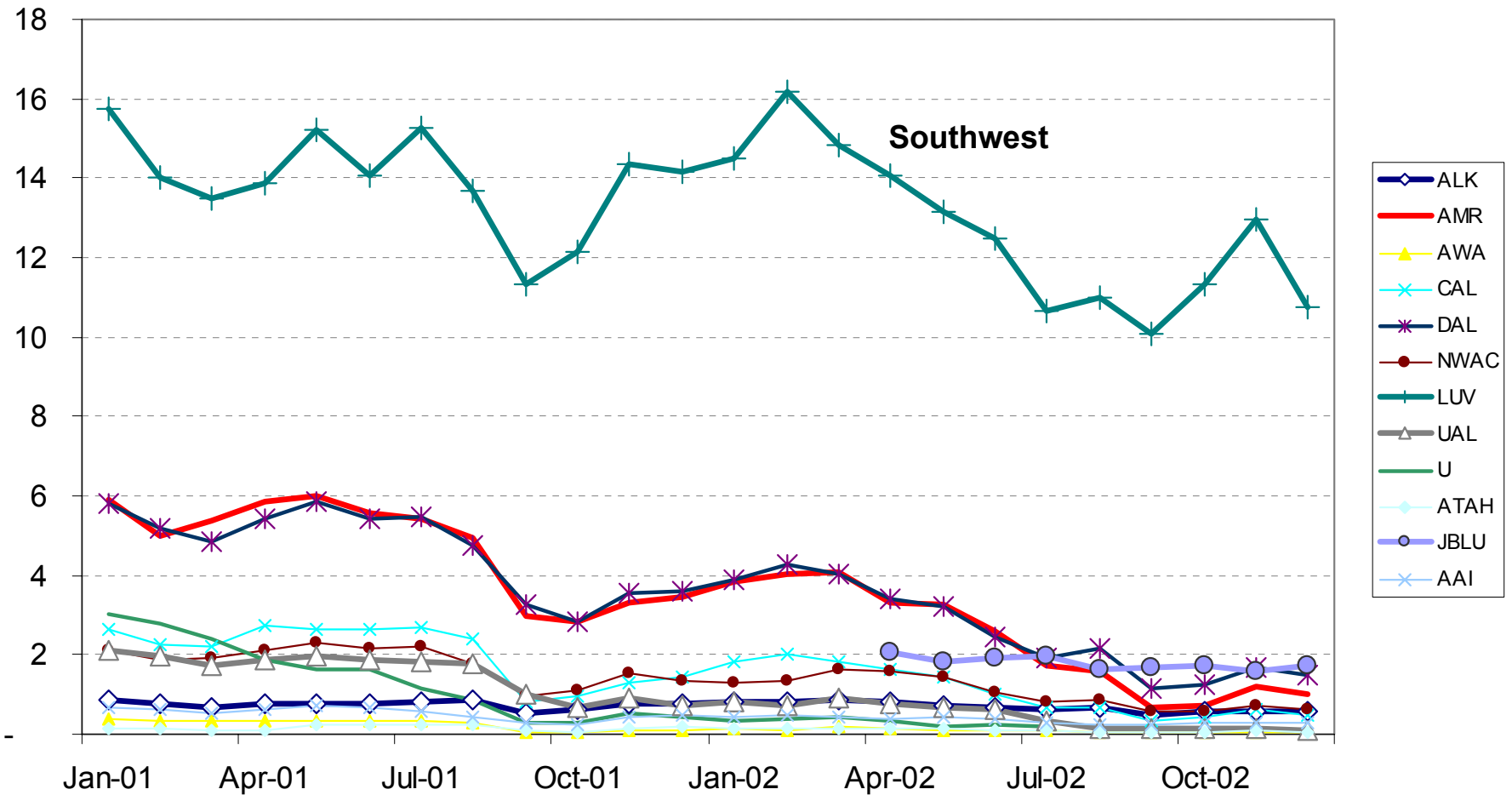
Airline Stock Prices: 1980-2002



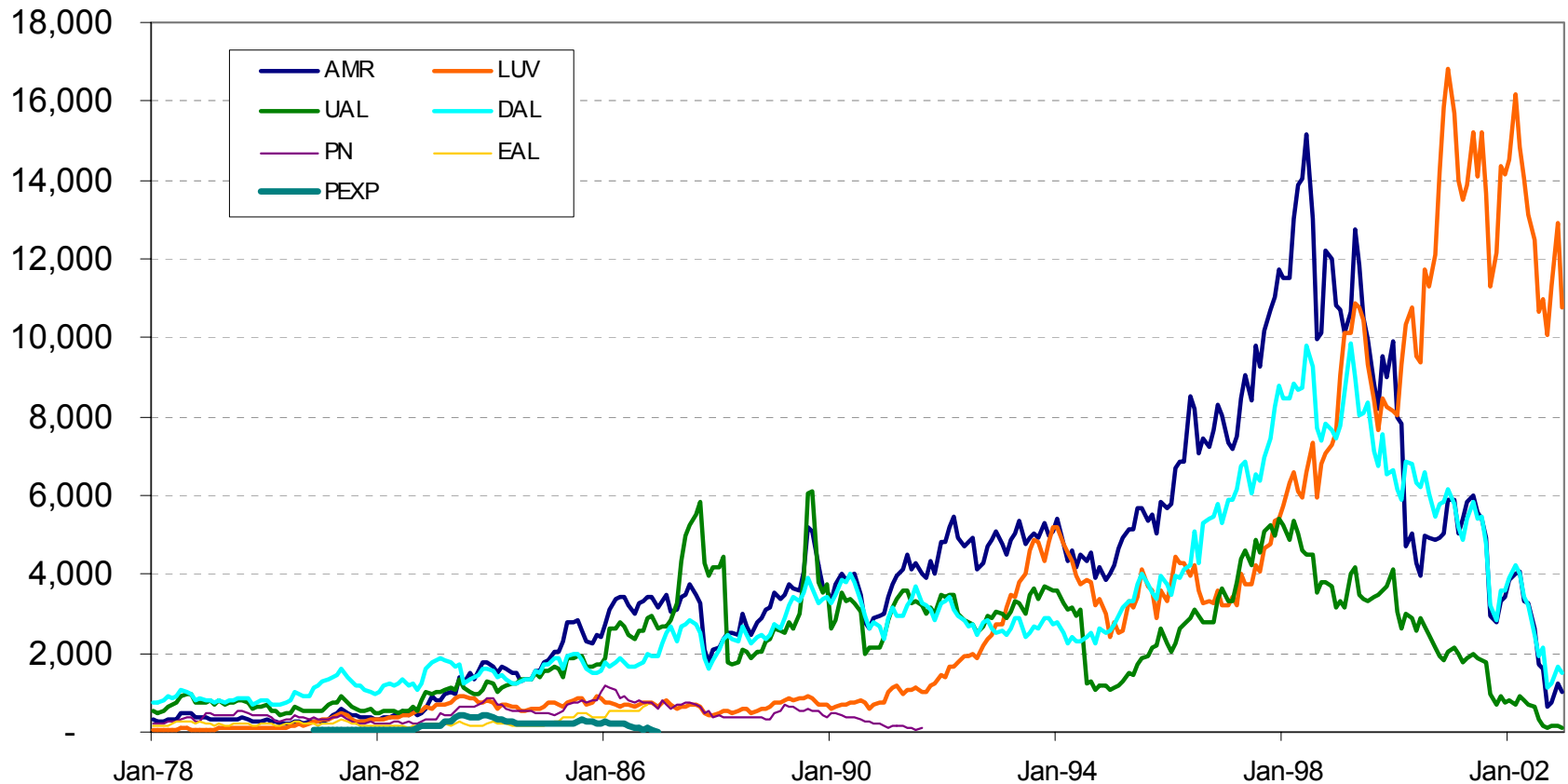
Recent Market Cap



Recent Market Cap

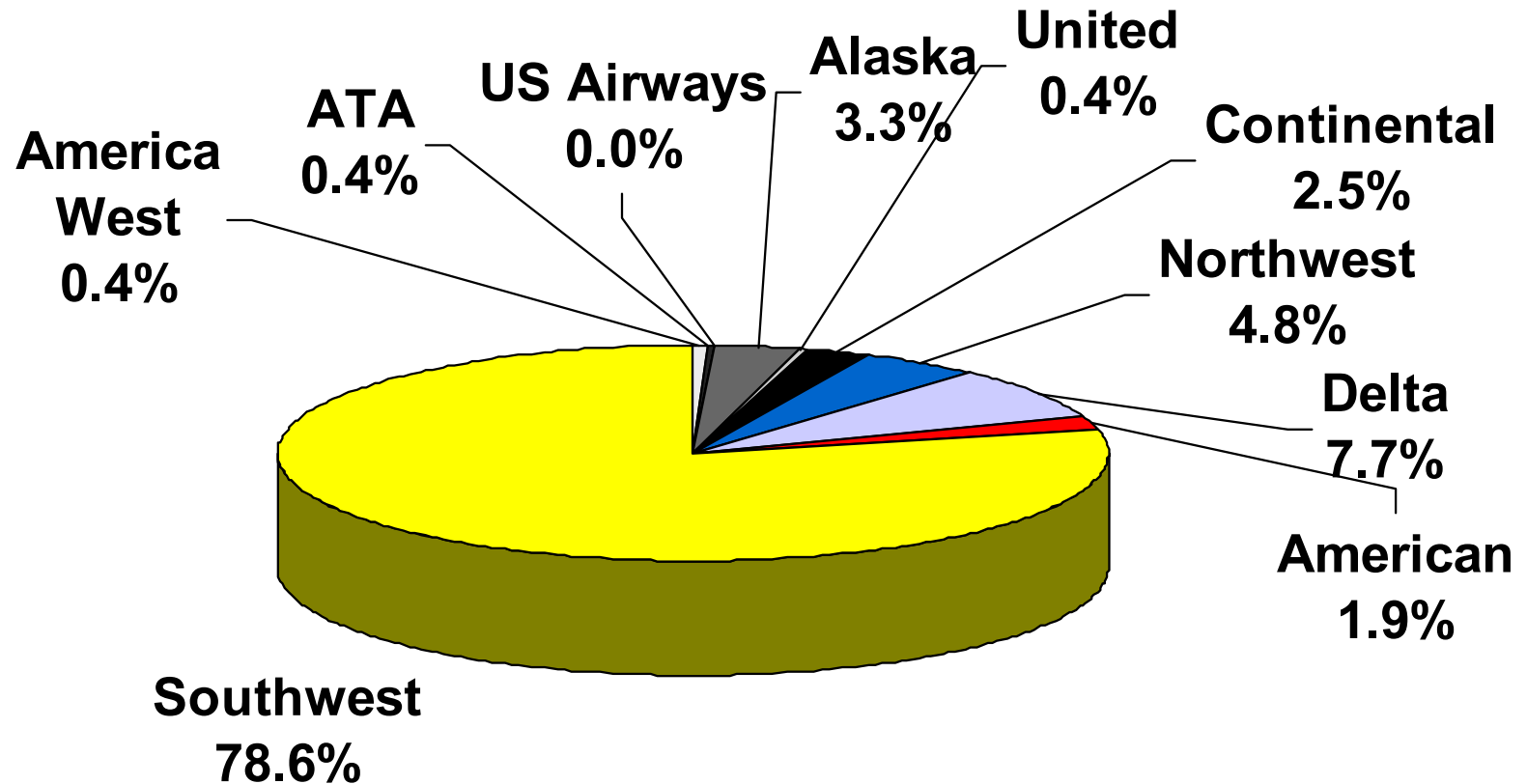


Historical Market Cap



Market Cap: US Majors

3/18/03

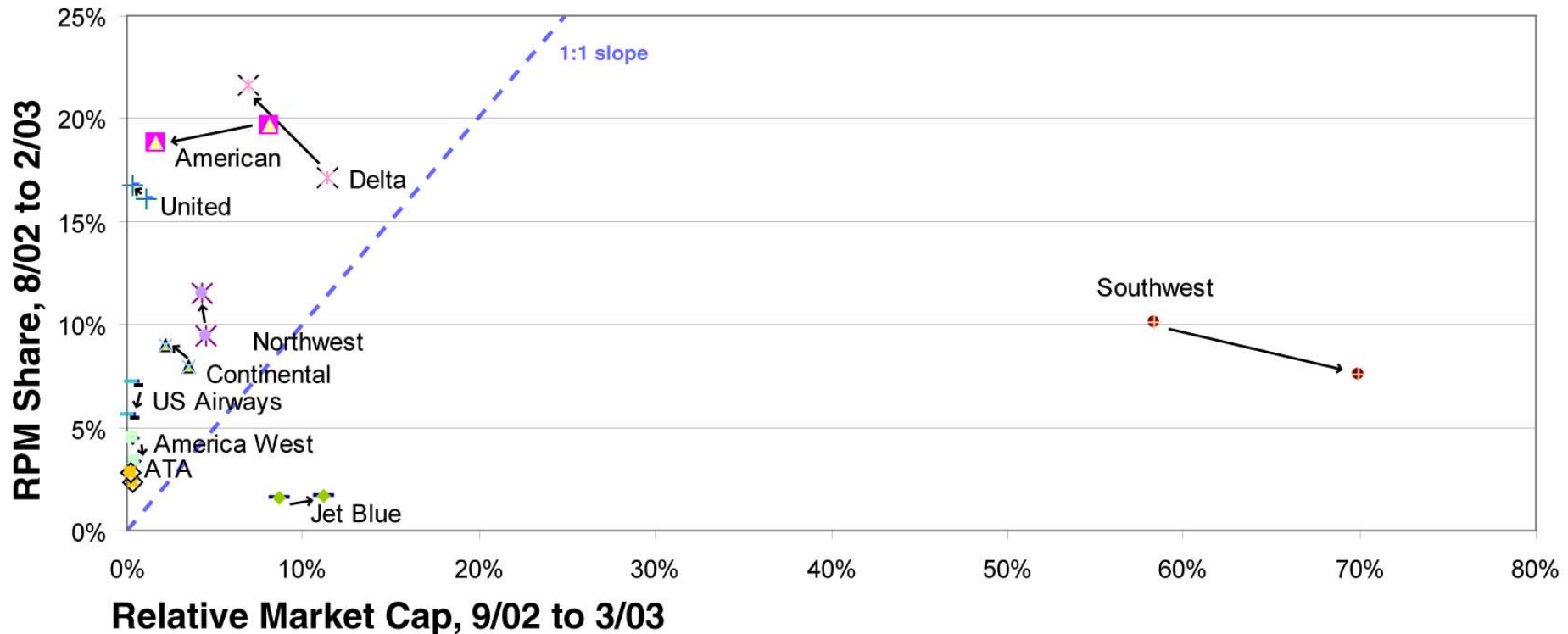


Total Market: \$14.0 billion

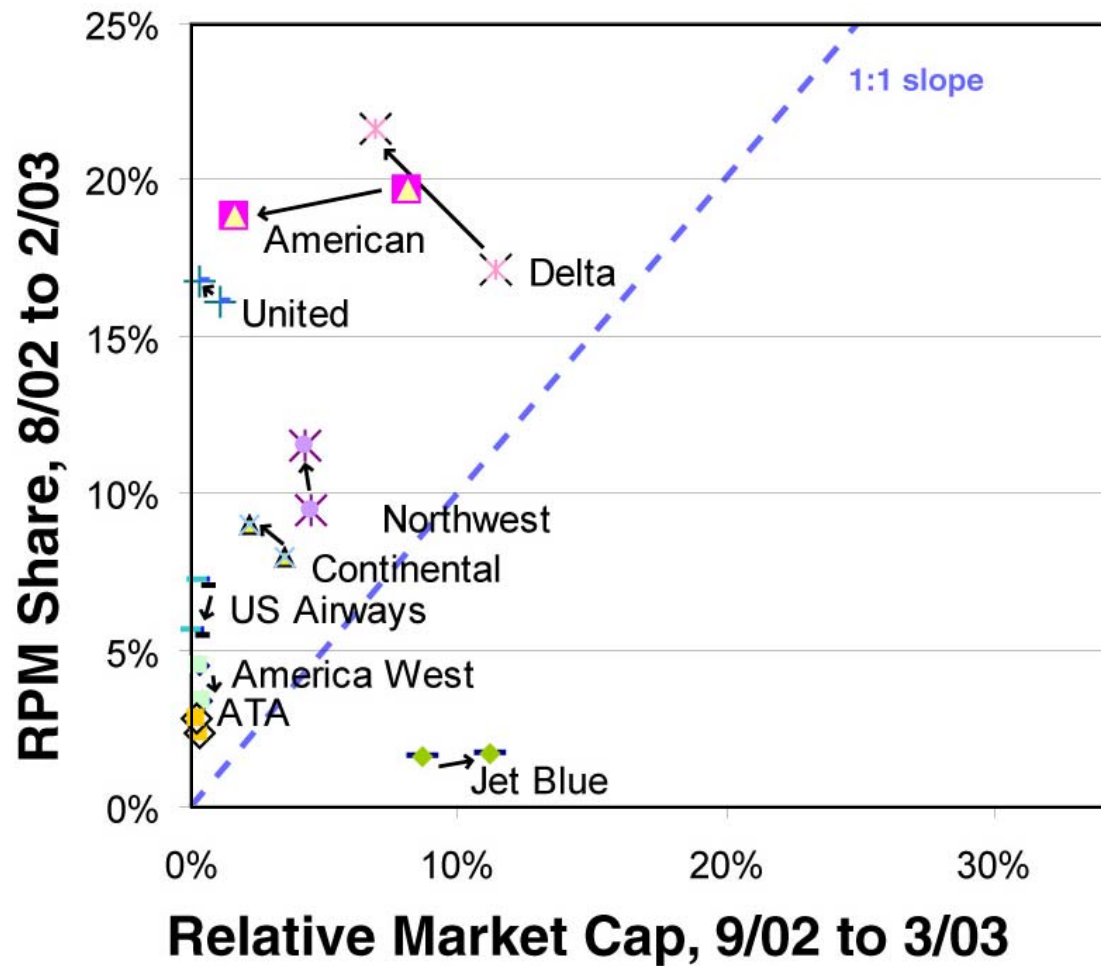
Source: Yahoo! Finance. Includes ATA

Market Cap

Change in Market Cap vs. RPM Share: US Majors

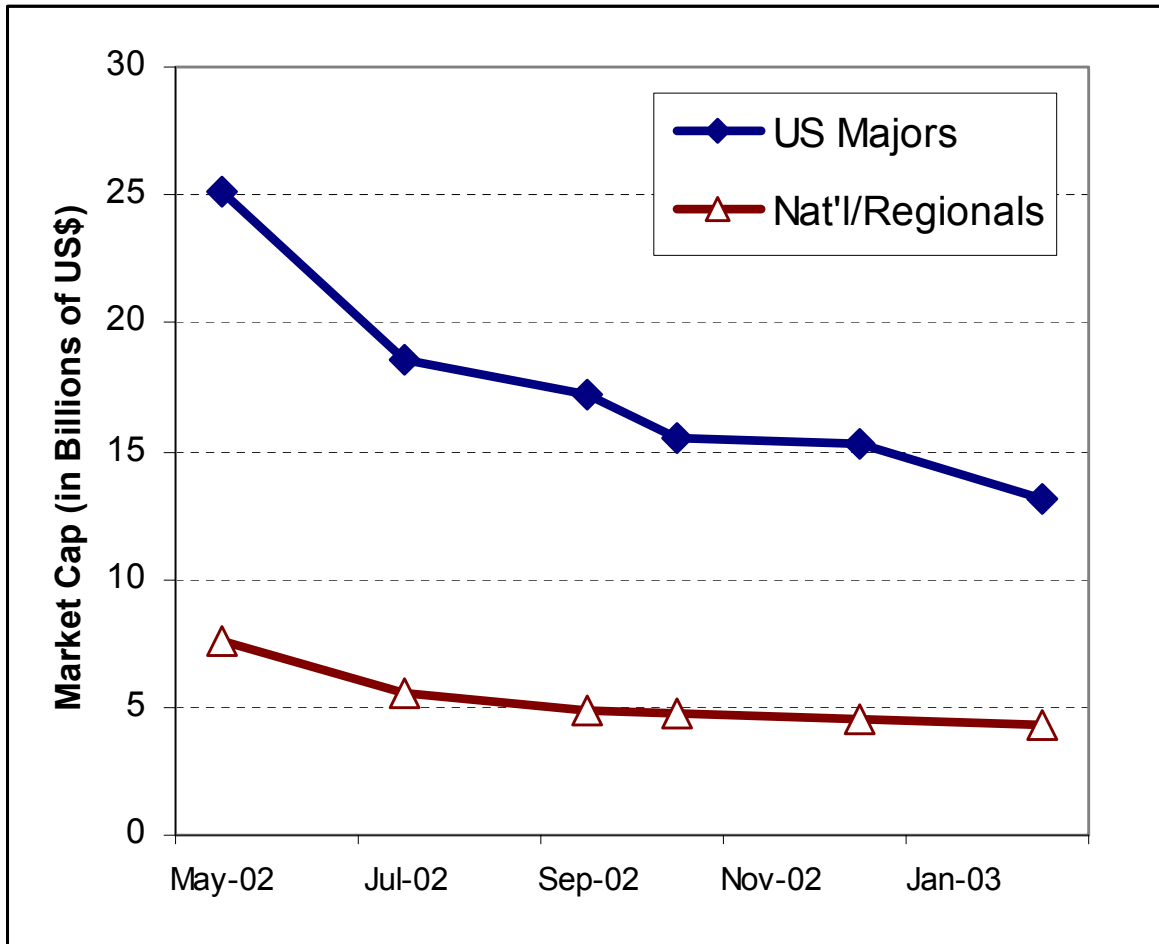


Source: Yahoo! Finance and airline traffic reports



Source: Yahoo! Finance
and airline traffic reports

Decline in Market Cap



**Losses since
May 2002:**

**Nat'l/Regionals
\$3.2 bil. (-43%)**

**US Majors
\$11.9 bil. (-48%)**

**\$17.6 billion
since Aug 2001
(55.7% drop)**

Source: Yahoo! Finance



Implications

Implications

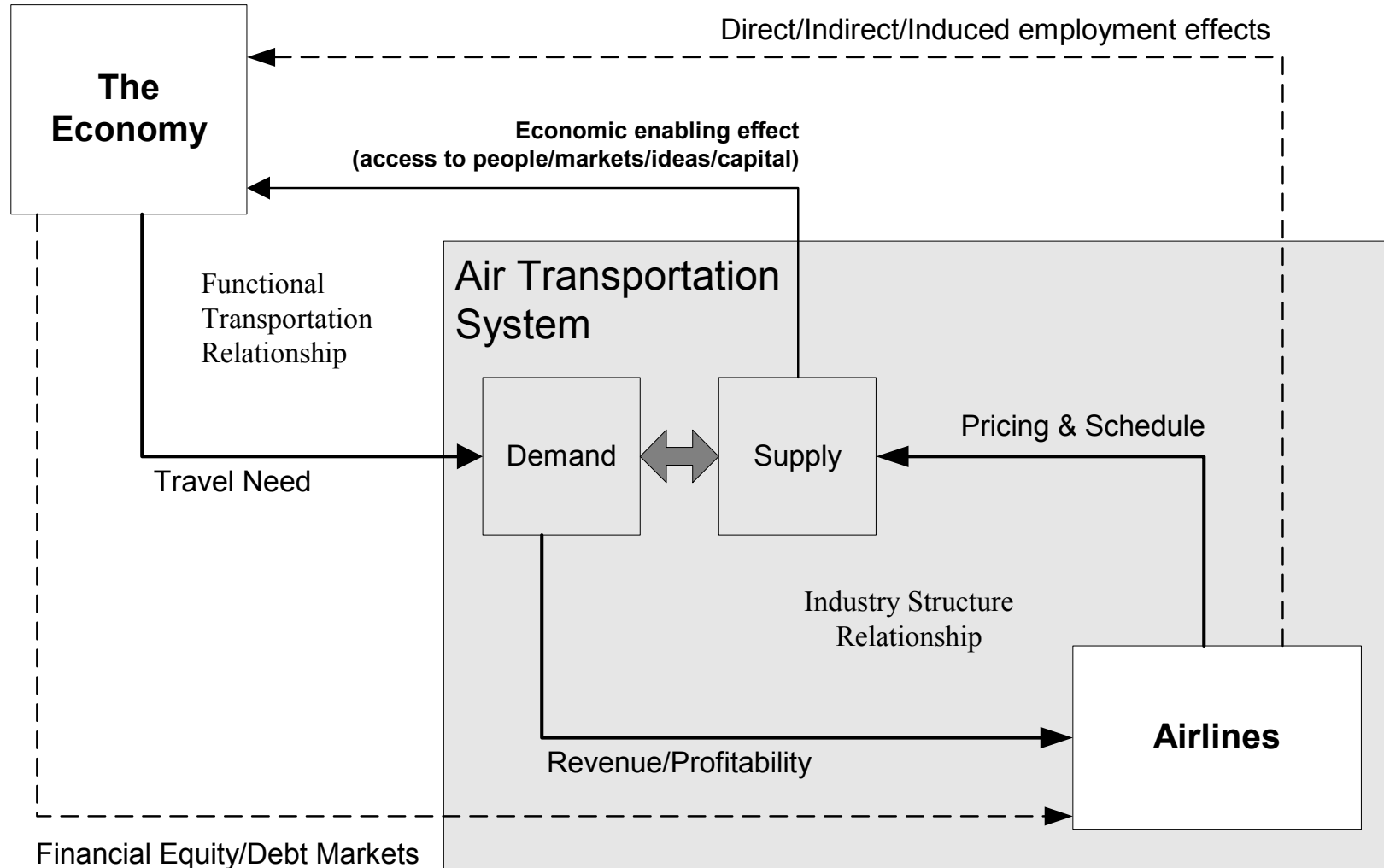
- **Airline traffic and revenues reflect fundamental changes in travel market**
- **Operational changes and industry restructuring represent attempt to maintain profitability**
- **Bottom line: airlines still losing money**

- **Financial markets do not believe in the long-term profitability of US Major Airlines**
- **Could affect ability to find capital for aircraft purchases, aviation infrastructure, etc..**
- **Lead to massive industry failure?**

Unclear Future

- **Are airlines sustainable over the long-term?**
 - Railroads, highways, transit?
 - Does air continues to add value to economic processes and flows?
 - Can the speed of air travel ever be replaced?
- **Ramifications for air transportation system: connectivity, level-of-service**

Conceptual Model





MIT International Center for Air Transportation

<http://web.mit.edu/aeroastro/www/labs/ICAT/>
<http://web.mit.edu/airlines/>

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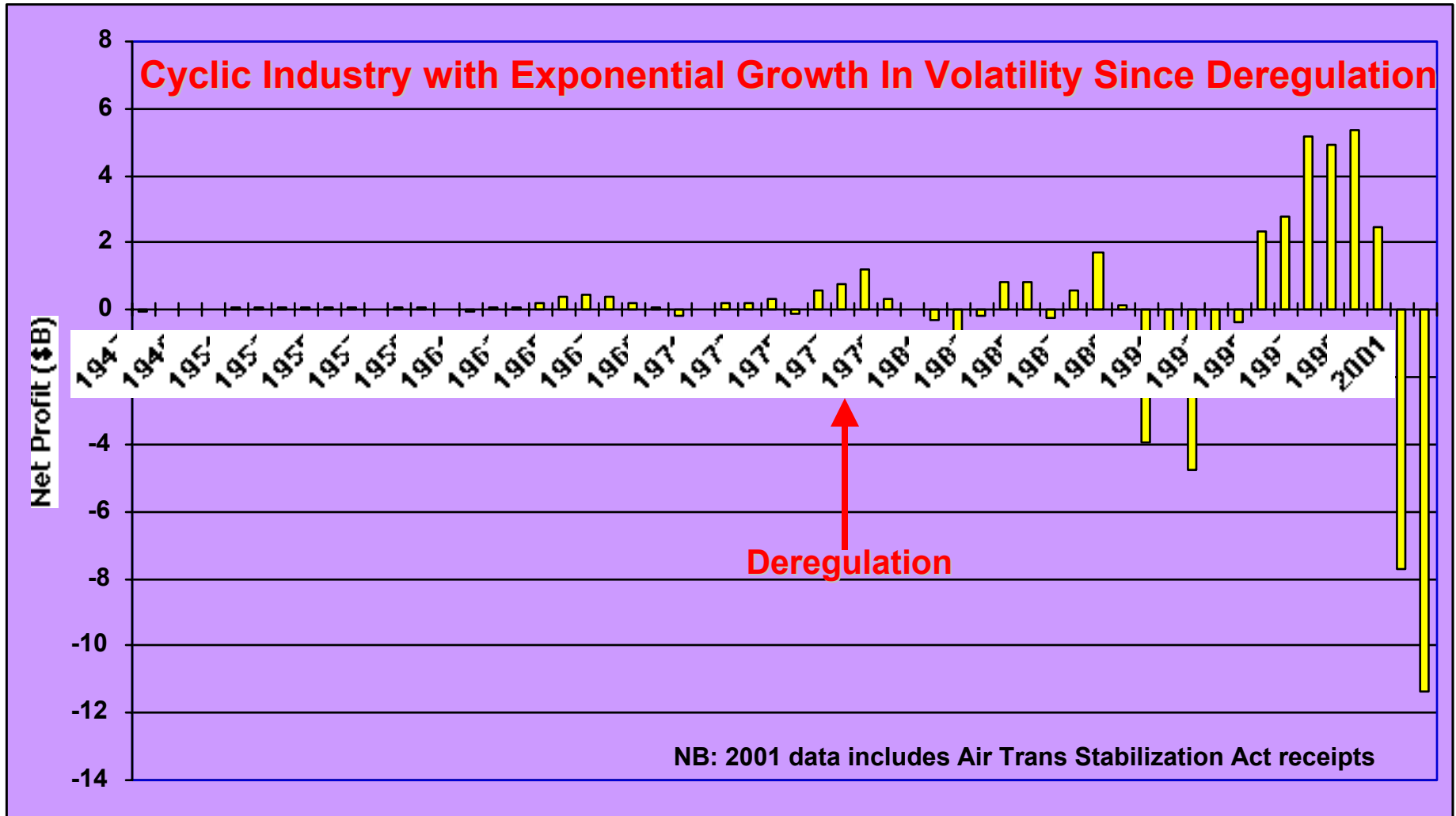
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US Airline Net Profit 1947-2001 (Annual)



US Airlines Net Profit Model

Best Fit of Undamped Oscillation

Cycle Period = 11.3 yr eFolding Time = 6.3 yr

